GIANT INGUINO-SCROTAL HERNIA WITH DUODENAL PERFORATION AND BILIARY PERITONITIS - A RARE CASE REPORT WITH LITERATURE REVIEW

General Surgery

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ABSTRACT

Background: Giant inguino-scrotal hernias are unusual, and associated with duodenal perforation causing peritonitis is an extremely rare presentation.

Case presentation: A 73 year old gentleman presented to the Emergency department (ED) with sudden onset of lower abdominal pain, bilious vomiting, and constipation. He had a huge right sided inguino-scrotal swelling. Computed tomography (CT) abdomen showed massive inguino-scrotal hernia containing pylorus, part of duodenum and loops of jejunum, ileum and large bowel upto descending colon as contents with signs of perforation. Labs were suggestive of sepsis. At emergency surgery, perforation of the second part of duodenum with generalized peritonitis was evident. Closure of the perforation and drainage was done as a damage control procedure and definitive hernia repair was deferred for a later period. Despite intensive-care, the patient succumbed to sepsis postoperatively.

Conclusion: This is a rare presentation of duodenal perforation secondary to giant inguino-scrotal hernia causing biliary peritonitis ensuing in sepsis and death. We reviewed the literature on giant inguinal hernia, and especially those associated with duodenal perforation.

KEYWORDS

Giant inguino-scrotal hernia, duodenal perforation, biliary peritonitis, sepsis

Case presentation:

A retired professor of 72 years, presented to the ED with lower abdominal pain for 2 days associated with bilious vomiting, constipation and difficulty in passing urine. He had no fever, abdominal distension or bleeding per rectum. There was an asymptomatic, progressively increasing right inguinal swelling since childhood which was ignored. His past medical history revealed hypertension, chronic kidney disease and coronary artery disease. He was married and had 2 kids.

He was afebrile, with a heart rate 90/minute, blood pressure 160/80mm Hg, respiratory rate 16/min and saturation by pulse oximetry of 98% on air. Abdomen was soft and non-distended with tenderness over the right iliac region and hypogastrium. Bowel sounds were sluggish.

Giant (55 x 35 cm) right sided, tense, tender and irreducible inguino-scrotal swelling burying his penis and extending up to his knee was noted (Figure-1). Scrotal skin was normal. Right testis could not be felt, while left testis was palpable.

Laboratory findings:

Creatinine- 3.7 mg/dl; BUN- 38.9 mg/dl; CRP- 21mg/dl

Lactate- 35.3 mg/dl; Procalcitonin- 164 ng/ml; Potassium- 5.4 mmol/L; Total leukocytes counts- 6500 cu.mm; Hemoglobin-11 g/dl; Sodium- 135 meq/dl; RBS- 193mg/dl.

CT abdomen and pelvis revealed distended stomach with air fluid level (Figure-3) and a large right inguinoscrotal hernia with pylorus, duodenum, small bowel loops, caecum, ascending colon, transverse

colon and descending colon along with omentum as contents (Figure-2). Hollow viscus perforation was noted; the site of which could not be ascertained.

Bedside echocardiogram and cardiology evaluation were unremarkable.

Figure-2 – Sagittal and coronal view of CT abdomen and pelvis showing herniated pylorus part of stomach, small and large bowel loops with signs of perforation

Mid-line laparotomy with extension along the right side of scrotum was done. The antrum and pylorus of stomach were seen within the inguinal canal along with 1st part of duodenum (D1). D2 and D3 segment till DJ flexure were seen retroperitoneally. Loops of the small bowel and large bowel upto descending colon were found within the scrotal sac.

A 2cm perforation along the posterior aspect of the 2nd part of the duodenum was noted with generalised peritonitis with massive bilious contamination of peritoneum and scrotum. (Figure-5) There was no bowel ischemia.

Graham's omentopexy of perforated D2, partial debulking omentectomy, decompression duodenostomy, decompression gastrotomy, feeding Jejunostomy were done. After thorough lavage

and multiple drains insertion, partial closure of the laparotomy was done.

Reduction of scrotal sac content was not attempted due to lack of space in the abdominal cavity and thickened retro-peritoneum, as it was feared to cause fulminant rise in intra abdominal pressure, and bowel debulking was not tried owing to generalized biliary peritonitis.

Intra-operatively he required inotropic support. Post-operatively, the patient was transferred to the intensive care unit and treated with antibiotics and antifungals. He could be weaned off initially, started on enteral feeds, developed AF needing cardioversion and renal failure needing hemofiltration. Despite initial improvement, His condition worsened and he succumbed to progressive sepsis and multi-organ failure by 8th Post-operative day.

Discussion:

Inguinal hernia is defined as a protrusion of the contents of the abdominal cavity or pre-peritoneal fat through a defect in the inguinal area¹. It is the commonest (75%) among all abdominal wall hernias with increased lifetime risk for males¹.

Giant inguinal hernia is defined as a hernia that extends below the level of the midpoint of the patient's inner thigh, in standing position or should exhibit an antero-posterior diameter of at least 30 cm or a transverse diameter of about 50 cm with non- reducibility of >10 years².

It is rare, comprising less than 5% of all inguinal hernia³, and prevalent among elderly men in rural areas, as a result of neglect, poverty or ignorance⁴.

The natural history of giant inguino-scrotal hernia is scrotal sac expansion as omentum enters first, followed by small bowel loops, ascending colon and caecum in right side and sigmoid colon in left side, and other parts of colon, rarely stomach and organs such as ovaries, urinary bladder and ureter along with kidney^{5,6}. Omental content increases gradually causing widening of the neck of the sac especially in direct hernias⁵.

Quality of the patient's life is affected with difficulty in walking, sitting or lying down and causes decreased mobility. It also affects working capacity, socialization, self esteem and coital satisfaction⁴. Skin complications such as dermatitis, infection due to urinary dribbling over the scrotal skin with necrosis and ulceration, renal complications like voiding difficulty, acute urinary retention, urinary tract infection, acute renal failure with ureter or bladder involvement^{5,6} are also reported. Irreducibility due to adhesions and intestinal obstruction or strangulation due to incarceration can occur.

Acute complications like gastric⁷ and duodenal perforations^{8,9,10} are rarely reported. Trakarnsagna et al has proposed a classification for inguino-scrotal hernia¹¹ which are Type I (mild)- Sac descends below the mid-inner thigh, but above the midpoint of mid-thigh and supra-patellar bone line, Type II (moderate) - Sac descends below the midpoint of mid-thigh and Supra patellar bone and Type III (severe) - Sac descends extends beyond the supra-patellar bone.

Surgical management of giant inguinal hernia are significantly challenging due to their rarity and post operative life threatening complications like cardio-pulmonary distress, abdominal syndrome, visceral perfusion insufficiency, decreased excursion of the diaphragm, increased risk of wound dehiscence and delayed wound healing due to loss of abdominal cavity domain¹¹, following rapid forceful reintegration of herniated contents into the peritoneal cavity. Recurrence and scrotal hematoma are also significantly higher¹².

Progressive pneumo-peritoneum therapy by injecting 100 to 500 mL of CO₂ daily for 15 days via intra-peritoneal catheter, increases the abdominal capacity preoperatively¹³, helps to facilitate visceral reduction and lung adaption. However it is contra-indicated in patients with cardiac diseases, strangulated hernia and infection¹³.

Component separation of abdominal wall or using mesh grafts or flaps to lengthening the abdominal wall also helps to achieve tension-less abdominal closure¹⁴.

Minimal invasive surgery like trans-abdominal pre-peritoneal (TAPP) repair has also been suggested¹⁴.

Giant inguino-scrotal hernia associated with duodenal perforation peritonitis is very unusual, and management is always challenging with high mortality. Only 3 cases^{8,9,10} have been reported so far in world literature, to the best of our knowledge (Table-2).

Table-2 : A list of documented Giant inguino-scrotal hernia associated with duodenal perforation peritonitis in world literature

Case No.	Age	Diagnosis	Intervention	Outcome	Reference
(1)	81y	Duodenal rupture with necrosis and peritonitis	Resection of the necrotic duodenum, Duodenostomy Gastrojejunostomy and Right hemicolectomy	Sepsis and Death	(15), 2012
(2)	62y	Duodenal perforation peritonitis	Resection of small bowel, caecum, ascending colon and mid transverse colon	Sepsis and Death	(8), 2016
(3)	81y	Duodenal rupture with perforated caecum and peritonitis	Right Hemicolectomy and side to side anastomosis of duodenum and jejunum	Anastomotic leak, Sepsis and Death	(9), 2017
(4)	72y	Duodenal perforation and biliary peritonitis	Source control, Graham's omentopexy, partial debulking omentectomy, decompression duodenostomy, and gastrostomy, and feeding Jejunostomy	Sepsis and Death	Index case

In our patient, because the loops of small and large bowel were found within the sac, without any features of obstruction and strangulation, and the histo-pathology of perforated edge was negative for malignancy /other pathology, we infer that the perforation has occurred due to constant downward traction. Ishii et al. also describe a similar mechanism in their case report¹⁰.

CONCLUSION:

Aggressive surgical treatment of giant inguino-scrotal hernia may prevent life threatening complications like perforation and sepsis. In emergency, the aim should be control of infection and physiological optimization rather than organ debulking and definitive repair. Even then, the mortality of this entity remains very high

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